

## ABSTRACT

A method for processing substrate to form a semiconductor device is disclosed. The substrate includes an etch stop layer disposed above a metal layer. The method includes etching through the etch stop layer down to the copper metal layer, using a plasma etch process that utilizes a chlorine-containing etchant source gas, thereby forming etch stop layer openings in the etch stop layer. The etch stop layer includes at least one of a SiN and SiC material. Thereafter, the method includes performing a wet treatment on the substrate using a solution that contains acetic acid ( $\text{CH}_3\text{COOH}$ ) or acetic acid/ammonium hydroxide ( $\text{NH}_4\text{OH}$ ) to remove at least some of the copper oxides. Alternatively, the copper oxides may be removed using a  $\text{H}_2$  plasma. BTA passivation may be optionally performed on the substrate.